REMARKS

Status of the Claims:

Claims 1-43 are currently in the application. Claims 1-20 and 24-35 have been rejected by the Examiner. Claims 21-23 and 36-41 have been allowed. Claim 25 has been canceled by combining all of the limitations of Claims 24 and 25 into Claim 24. Claim 31 has been canceled by combining all of the limitations of Claims 30 and 31 into Claim 30. Claims 42 and 43 have been added. As a result of the amendments contained herein, and in view of the following remarks, Applicant respectfully submits that the application is in form for immediate allowance.

Drawing Objections:

The drawings have been objected to by the Examiner for informalities including element numbers shown that do not match with numbers in the specification, and because the drawings fail to show or label one or more elements numbered and identified in the specification. In response to the Office Action dated August 28, 2003, Applicant amended the drawings and the specification in response thereto. Applicant notes that the objection to the drawings has been withdrawn, however, the Office Action summary does not indicate that the drawing amendments have been accepted by the Examiner.

In Applicant's review of the application in response to the Office Action dated April 22, 2004, Applicant has noted that several element numbers are still in error. Proposed amendments to the drawings are submitted herewith to place the drawings in correct form. Regarding Fig. 9, one of the two accelerometers shown to the left of the XYZ axis depiction was miss-numbered

87 and not 85. Similarly, illustrated to the left of the angular velocity depiction, one of the rate sensors 87 was mislabeled 85.

Similarly, in Fig. 10, an accelerometer and a rate sensor were mislabeled. By these changes to Figs. 9 and 10, no new matter has been added. It is absolutely clear from the wiring connections between the accelerometers and the rate sensors that they were initially mislabeled. Applicant is only correcting the drawings based upon the disclosure of the invention as originally filed.

The drawings as amended display the accelerometers and velocity rate sensors in the only way possible to derive 3-dimensional acceleration data. These proposed drawing amendments are also totally consistent with Applicant's provisional application disclosure.

Claim Rejections - § 103:

Reconsideration of Claims 1-8, 10, 11, 13, 15-20 and 24-35, rejected under 35 U.S.C. § 103(a) as being unpatentable over Kirtley in view of Darley et al and Fyfe et al, is respectfully requested. Reconsideration of Claim 9, rejected under 35 U.S.C. § 103(a) as being unpatentable over Kirtley in view of Darley et al and McTeigue et al, is respectfully requested. Reconsideration of Claim 12, rejected under 35 U.S.C. § 103(a) as being unpatentable over Kirtley in view of Darley et al and O'Heir, is respectfully requested. Reconsideration of Claim 14, rejected under 35 U.S.C. § 103(a) as being unpatentable over Kirtley in view of Darley et al and Gray et al, is respectfully requested. Consideration of Claims 42 and 43 is also respectfully requested.

Applicant respectfully submits that the Examiner has failed in each instance to establish a prima facie case of obviousness because the Kirtley reference cited is not a prior reference with respect to the application. As a result, Applicant respectfully requests that the Examiner reconsider and withdraw each and every rejection made on this basis.

On page 1, in the paragraph starting on line 3, Applicant has made a claim of domestic priority based upon a provisional patent application filed August 18, 2000, having serial number 60/226,011. The Examiner has indeed acknowledged such claim, according to line 15 of the Office Action Summary provided with the Office Action dated August 28, 2003.

The effective prior art date for Kirtley, which is a U.S. patent application publication and not an issued patent, is determined by § 102(e)(1), and comprises its filing date as an application, provided that such date is before the date of invention by Applicant. If not before Applicant's invention date, the reference is not prior art. The filing date of the Kirtley application is June 22, 2001, which is over 10 months after Applicant's claimed priority date. The Examiner has pointed out to Applicant that Kirtley has made a claim of domestic priority based on a provisional patent application filed on June 24, 2000, having a serial number of 60/213,981, over one month before Applicant's claim of priority. Based upon the provisional application, the Examiner submits that the rejection is proper and that Kirtley is prior art. 35 U.S.C. § 19 states in part:

> "(1) an application for patent filed under Section 111(a) or Section 363 of this title for an invention disclosed in the manner provided by the first paragraph of Section 112 of this title and a provisional application filed under Section 111(b) of this title, by an inventor named in the provisional application shall have the same affect as

> to such invention as though filed on the date of the provisional application filed under Section 111(b) of this title. If the application for patent filed under Section 111(a) or Section 363 of this title is filed not later than 12 months after the date on which the provisional application was filed and if it contains or is amended to contain a specific reference to the provisional application. * * *"

That being the case, the Kirtley reference is only prior art to that which is disclosed in the Kirtley provisional application. However, there are major differences between the disclosure in the Kirtley provisional application and the Kirtley patent publication (U.S. 2003/0009308).

The patents issued to Kirtley, Darley et al and Fyfe et al do not teach or suggest Applicant's portable human gait analysis apparatus as claimed for releasable securement about a user's foot as claimed in Claims 1, 11, 21, 24 as amended, 27, 29, 30 as amended, 33 or 35:

> "1. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises:
>
> a) a detachable sole;
>
> b) a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot;
>
> c) a plantar pressure collecting unit positioned between a plantar side of said user's foot and the detachable sole;
>
> d) a rearfoot motion collection unit having at least one accelerometer sensor and at least one rate sensor;
>
> e) a lower shank motion collection unit having at least one accelerometer sensor and at least one rate sensor;
>
> f) a detachable processing unit in electrical communication with the plantar pressure collection unit, the rearfoot motion collection unit, and the lower shank motion collection unit, said detachable

processing unit for processing data from a plurality of said accelerometers and said sensors; and

g) a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"11. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises:

a) a detachable sole which is flexible, durable, electrically insulating, and resilient;

b) a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot;

c) a plantar pressure collection unit positioned between a plantar side of said users foot and the detachable sole, to identify the center of pressure line and excessive and abnormal loads on the sole of the foot;

d) a rearfoot motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to calculate rearfoot kinematic data crucial to identify the motions of pronation and supination;

e) a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, which when combined with data from the rearfoot kinematic data, to provide three dimensional static and dynamic acceleration, angular velocity, two-axis tilt information, and static and dynamic foot movements;

f) a detachable processing unit in electrical communication with the plantar pressure collection unit, the rearfoot motion collection unit, and the lower shank motion collection unit, said detachable processing unit for processing data from said accelerometers and said plurality of sensors; and

g) a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"21. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises:

a) a detachable sole which is flexible, durable, electrically insulating, and resilient;

b) a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot;

c) a plantar pressure collection unit positioned between a plantar side of said user's foot and the detachable sole, to identify the center of pressure line and excessive and abnormal loads on the sole of the foot;

d) a rearfoot motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to calculate rearfoot kinematic data crucial to identify the motions of pronation and supination;

e) a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, which when combined with data from the rearfoot kinematic data, provides three dimensional static and dynamic acceleration, angular velocity, 2-axis tilt information, and static and dynamic foot movements;

f) a detachable processing unit in electrical communication with the plantar pressure collection unit, the rearfoot motion collection unit, and the lower shank motion collection unit, said detachable processing unit for processing data from said accelerometers and said plurality of sensors, which has been normalized by body weight and calibration; and

g) an LCD visual display unit in electrical communication with the detachable processing unit

for displaying the data comprises vital gait information, including over-pronate, supinate, and neutral plantar pressure/distribution and the amount of eversion/inversion angle of the user's foot."

"24. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a plantar pressure collection unit positioned between a plantar side of said user's foot and the detachable sole, a rearfoot motion collection unit having at least one accelerometer sensor and at least one rate sensor, a detachable processing unit in electrical communication with the plantar pressure collection unit, said detachable processing unit being configured for processing data from the plantar pressure collection unit, said detachable processing unit further being in electrical communication with said rearfoot motion collection unit, said processing unit being further configured for processing data from at least one accelerometer sensor and said at least one rate sensor, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"27. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a rearfoot motion collection unit having at least one accelerometer sensor and at least one rate sensor, a detachable processing unit in electrical communication with the rearfoot motion collection unit, said detachable processing unit being configured for processing data from said at least one accelerometer sensor and said at least one rate sensor, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"29. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a lower shank motion collection unit having at least one accelerometer sensor and at least one rate sensor, a detachable processing unit in electrical communication with the lower shank motion collection unit, said detachable processing unit being configured for processing data from said at least one accelerometer and said at least one rate sensor, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"30. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole which is flexible, durable, electrically insulating, and resilient, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a plantar pressure collection unit positioned between a plantar side of said user's foot and the detachable sole, to identify the center of pressure line and excessive and abnormal loads on the sole of the foot, a detachable processing unit in electrical communication with the plantar pressure collection unit, said detachable processing unit being configured for processing data from said plantar pressure collection unit, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit, a rearfoot motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to calculate rearfoot kinematic data crucial to identify the motions of pronation and supination, said detachable processing unit further being in electrical communication with the rearfoot motion collection unit, said detachable processing unit being further configured for processing data from said at least one accelerometer sensor and said plurality of rate sensors."

"33. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole which is flexible, durable, electrically insulating, and resilient, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a rearfoot motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to calculate rearfoot kinematic data crucial to identify the motions of pronation and supination, a detachable processing unit in electrical communication with the rearfoot motion collection unit, said detachable processing unit being configured for processing said rearfoot kinematic data from said at least one accelerometer sensor and said plurality of rate sensors, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"35. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole which is flexible, durable, electrically insulating, and resilient, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, a detachable processing unit in electrical communication with the lower shank motion collection unit, said detachable processing unit being configured for processing said lower shank motion data from said at least one accelerometer sensor and said plurality of rate sensors, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"42. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole, a soft casing unit having a detachable sole cover,

a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a plantar pressure collection unit positioned between a plantar side of said user's foot and the detachable sole, said plantar pressure collection unit having four sensor resistors and pressure sensors along a first phalange, a second phalange, a third phalange, a fourth phalange in the forefoot, along a first metatarsal head, a second metatarsal head and a fourth metatarsal head in the forefoot, along a first metatarsal base, a fourth metatarsal base and a fifth metatarsal base in the midfoot, underneath a distal portion of a medial and lateral side of a calcaneus in the midfoot, and at the medial and lateral surfaces of a calcaneus in the rearfoot, to provide accurate measurement of maximum pressure, mean pressure, and the center of pressure line, a detachable processing unit in electrical communication with the plantar pressure collection unit, said detachable processing unit being configured for processing data from the plantar pressure collection unit, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

"43. A portable human gait analysis apparatus for releasable securement about a user's foot, wherein the apparatus comprises: a detachable sole which is flexible, durable, electrically insulating, and resilient, a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot, a plantar pressure collection unit positioned between a plantar side of said user's foot and the detachable sole, to identify the center of pressure line and excessive and abnormal loads on the sole of the foot, said plantar pressure collection unit having four sensor resistors and pressure sensors along a first phalange, a second phalange, a third phalange, a fourth phalange in the forefoot, along a first metatarsal head, a second metatarsal head and a fourth metatarsal head in the forefoot, along a first metatarsal base, a fourth metatarsal base and a fifth metatarsal base in the midfoot, underneath a distal portion of a medial and lateral side of a calcaneus in the midfoot, and at the medial and lateral surfaces of a calcaneus in the rearfoot, to

> provide accurate measurement of maximum pressure, mean pressure, and the center of pressure line, a detachable processing unit in electrical communication with the plantar pressure collection unit, said detachable processing unit being configured for processing data from said plantar pressure collection unit, and a visual display unit in electrical communication with the detachable processing unit for displaying the data processed by the processing unit."

The Kirtley provisional application essentially does not disclose any accelerometers[1]. In contrast, the Kirtley provisional application discloses only three pressure sensors (FSRs) in the forefoot and one gyro rate sensor to measure the angular tilt (velocity) data. There is no explanation or clear indication of the placement of the three pressure sensors, nor is there any mention in the provisional application of use of any more than one gyro, the alignment of the gyro is unclear, leaving the alignment issue indeterminate at the very best.

Each of Applicant's claims above quoted require "at least one accelerometer sensor and at least one rate sensor" (Claims 1, 24, 27, 29); "at least one accelerometer sensor and a plurality of rate sensors" (Claims 11, 30, 33, 35).

[1] The Kirtley provisional application mentions an accelerometer on page 4, line 4. However, it is not clear whether he uses the word "accelerometer" to refer to a device similar to the accelerometers of Applicant. This mention of "accelerometer on page 4 is the only mention of "accelerometer" in the entire Kirtley provisional application. The entire Kirtley provisional application deals with the mounting of sensors for calculation of gait analyses parameters (e.g., ankle power) and such parameters as described in the application cannot be achieved by the use of accelerometers. As well known to persons skilled in the art, gyro sensors and accelerometers are totally different apparatus. A gyro sensor measures angular velocity. An accelerometer measures changes in velocity about a linear axis. Kirtley teaches against the use of accelerometers on page 5 in the first full paragraph of his provisional application. There is no illustration of an accelerometer in Kirtley's provisional application drawings. The brief summary of the invention and other portions of the specification of his provisional application confirm that the invention relates to an apparatus to record ankle joint velocity (not acceleration) during the push-off phase of the gait.

The Examiner's application of the Kirtley reference to Claims 1, 2, 5, 10, 11, 13, 15, 18 and 24-35 refers to the Kirtley patent (U.S. 2003/0093808) and not the Kirtley provisional application (USSN 60/213,981) filed on June 24, 2000 (one month before Applicant's claim of priority). Thus, Applicant submits that the Examiner is misapplying the Kirtley patent disclosure as only the Kirtley provisional disclosure and that portion of the Kirtley provisional disclosure which was reproduced in the Kirtley patent disclosure is prior art. There is no disclosure in the Kirtley provisional application (USSN 60/213,981) filed on June 24, 2000, of "a motion collection unit having at least one accelerometer sensor and at least one rate sensor and a lower shank motion collection unit having at least one accelerometer sensor and at least one rate sensor * * * detachable processing unit * * * processing data from a plurality of accelerometers and sensors * * *." The Kirtley provisional application discloses no accelerometers at all.

Further, Kirtley fails to disclose "a soft casing unit having a detachable sole cover, a detachable foot cover, a detachable shank cover, and a releasable securement means for releasably and adjustably securing the detachable sole cover, the detachable foot cover, and the detachable shank cover about said user's foot" as acknowledged by the Examiner on page 3 of the Office Action to which this Amendment is responsive.

The patent issued to Darley et al discloses an apparatus for monitoring locomotion of a person that can be secured to a person's shoe. The Examiner is incorrectly applying the Darley et al shoe to Applicant's "soft casing unit" and Applicant's "detachable sole" (Claims 1, 11, 24, 27, 29, 30, 33 and 35). Applicant's soft casing unit 61 is comprised of detachable parts known as the foot cover 63, the shank cover 64, and the sole cover 62, where the rearfoot motion collection

unit 22, the lower shank collection unit 26, and the processing and display unit 40 are attached by releasable securement means 65 such as a zipper or hook or loop-type fastening means. The soft casing unit 61 is preferably made to be selectively worn with or without shoes. All components are detachable, replaceable and function independently of each other (Applicant's specification, page 11). Applicant's soft casing unit either fits within the shoe or can be used on a bare foot. The bare foot feature allows for the user to determine his/her rearfoot motion and plantar pressures without the influence of a shoe. This feature provides the user with his/her true gait measurements and is unique to Applicant's structure. There is no teaching in the Kirtley provisional application or the Kirtley patent of such a device. The Kirtley insole is one piece that depends upon a shoe for usage. Kirtley's insole cannot be used to record data when the user is bare foot.

In Applicant's portable human gait analysis apparatus, both the rearfoot motion collection unit and the lower shank motion collection unit incorporate accelerometers and rate sensors for the purpose of measuring and processing acceleration and angular velocity data with respect of the foot to the shank: foot-shank motion. The acceleration and angular velocity data can be displayed for the user (by a computer) and can then determine 3-dimensional rearfoot motion of the subtalar and talocrural joints (ankle joint complex). The rearfoot motion collection unit and the lower shank motion collection unit also incorporate accelerometers and rate sensors for determining foot-floor motion (acceleration, velocity, angles) independently.

Applicant's plantar pressure collecting unit configures 12 pressure sensors (and/or four sensor resistors) aligned in a specific format within the insole in order to determine max and

mean pressures at the desired locations and the center of pressure progression line (a.k.a. gaitline). Gaitline data cannot be determined using the Kirtley device. The plantar pressure collecting unit describes the pressure sensors along the first phalange, the second phalange, and the third and fourth phalanges in the forefoot, along the first metatarsal head, second metatarsal head, and fourth metatarsal head in the forefoot, along the first metatarsal base and fourth and fifth metatarsal base in the midfoot, underneath the distal portion of the medial and lateral sides of the calcaneus in the midfoot, and at the medial and lateral surfaces of the calcaneus in the rearfoot. Thus, gaitline data is unique to Applicant's device, as well as other pressure distribution analyses based on pressure sensor locations.

In contrast, the Kirtley provisional patent application discloses only three pressure sensors in the forefoot and there is no explanation or clear indication of determined placement of these sensors. The provisional application also discloses one gyro rate sensor to measure angular tilt (velocity) data and the alignment is unclear although mentioning a transverse alignment and "location is not critical" leaving the alignment issue extremely vague and indeterminate at best.[2] A gyro rate sensor is well known in the art to measure rate of angular sway (velocity) and to be totally different than an accelerometer which measures linear velocity differences.

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[2] The Kirtley provisional application discloses an instrumated insole utilizing a miniature, solid state gyro sensor to record ankle joint velocity during the push-off phase of gait. The Kirtley invention uses a gyro sensor. The only mention of multiple gyros is on page 4 in the language "a total system concept consists of various sensors (including, but perhaps not limited to) one or more Murata gyros and FSRs, along with a miniature datalogger and radio telemetry unit, all mounted within a standard flexible insole around 4-5 mm thick. A head (cap) mounted gyro system for the assessment of head rotations for balance and vestibular monitoring, is also envisioned." Thus, the only multiple gyros disclosed is one that is in the insole of the Kirtley device and one that is in a cap for measuring velocity of head rotations. Applicant respectfully submits that head rotation has nothing to do with the focus of the Kirtley invention, which is a device mounted in a shoe insole for recording ankle joint velocity during the push-off phase of gait.

Applicant's device also processes all of the data, stores the raw and/or processed data and displays the analyzed (eversion/inversion angle, gait type identification, e.g. supinator, neutral pronator, etc.) data to the user in immediate and real time. This feature is unique to Applicant's apparatus. The processing unit can also interact with other processing display media via telemetry communication means. Kirtley's device cannot display any measurements or analysis to the user in real time. Kirtley only stores the data for retrieval at a later time. The Kirtley device focuses on a few key biomechanical measurements to measure "ankle torque," ultimately leading to "ankle power" push off. Kirtley's device can only be used in conjunction with a shoe. Studies refute the ability to determine true rearfoot motion from a shoe making the motion of the heal bones relative to the shank the only way to measure rearfoot motion.

The provisional application of Kirtley and the patent issued to Fyfe et al cannot be combined. There is no teaching whatsoever in the Kirtley provisional application of any measurement other than the three pressure sensors in the forefoot and the one gyro rate sensor to measure the angular tilt (velocity) of the foot in an undetermined alignment. Thus, there is no teaching in the principal reference of any rearfoot motion collection unit or any motion collection unit mounted in the rear of the shoe. The provisional patent application of Kirtley teaches against such an addition by limiting itself to measurements of "ankle torque," ultimately leading to "ankle power" of push off.

Claims 2-6 and 8-10 are each dependent upon Claim 1. Thus, Claims 2-6 and 8-10 include all of the language of Claim 1 and are submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 1. Claim 2 further requires:

"said soft case unit is sized to fit within a user's shoe, with the rearfoot motion collection unit, the lower shank motion unit, and the processing and display unit attached to the outer portion of the user's shoe."

Claim 3 further requires:

"independent measurements are taken for said user's right foot and left foot, and said processing and display units function independently of each foot."

Claim 4 further requires:

"past data is stored in memory, and processed by the central processing unit for comparison between use."

Claim 5 further requires:

"the display unit is a LCD display unit."

Claim 6 further requires:

"the data from the central processing unit passes through an I/O unit to a telemetry unit for transfer to at least one of a PC and PDA, for storage and further analysis."

Claim 8 further requires:

"the central processing unit processes data from the plurality of accelerometers and sensors to determine pronation, supination and normal data based upon data received from the rearfoot motion collection unit and lower shank motion collection unit."

Claim 9 further requires:

"a user's body weight is calibrated by the central processing unit to provide a baseline for processing data."

Claim 10 further requires:

> "the detachable sole is flexible, durable, electrically insulating, and resilient."

Claim 7 is dependent upon Claims 6 and 1. Thus, Claim 7 includes all of the language of Claims 6 and 1 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 1. Claim 7 further requires:

> "the data from the telemetry unit is transferred to at least one of: a walkman, a TV, a VCR, a DVD player, a CD player, a projection unit, a game console, a stereo and an internet site for entertainment purposes."

Claims 12-19 are each dependent upon Claim 11. Thus, Claims 12-96 include all of the language of Claim 11 and are submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 11. Claim 12 further requires:

> "the plantar pressure collection unit positions force sensor resistors and pressure sensors along a first phalange, a second phalange, a third phalange, a fourth phalange in the forefoot, along a first metatarsal head, a second metatarsal head, and a fourth metatarsal head in the forefoot, along a first metatarsal base, a fourth metatarsal base and a fifth metatarsal base in the midfoot, underneath a distal portion of a medial and lateral side of a calcaneus in the midfoot, and at the medial and lateral surfaces of the calcaneus in the rearfoot, to provide accurate measurement of maximum pressure, mean pressure, and pressure line."

Claim 13 further requires:

> "the information displayed on the processing and display unit comprises vital gait information, including over-pronate, supinate, and neutral plantar pressure distribution and the amount of eversion/inversion angle."

Claim 14 further requires:

"the processing and display unit provides a color coded mapping data, which has been normalized by body weight calibration."

Claim 15 further requires:

"said soft casing unit is sized to fit within a user's shoe, with the rearfoot motion collection unit, the lower shank motion unit, and the processing and display unit attached to the outer portion of the user's shoe."

Claim 16 further requires:

"independent measurements are taken for said user's right foot and left foot, and said processing and display units function independently of each foot."

Claim 17 further requires:

"past and current data is stored in memory, and processed by the central processing unit for comparison between use."

Claim 18 further requires:

"the display unit is a LCD display unit."

Claim 19 further requires:

"the data from the central processing unit passes through an I/O unit to a telemetry unit for transfer to at least one of a PC and PDA, for storage and further analysis."

Claim 20 is dependent upon Claims 19 and 11. Thus, Claim 20 includes all of the language of Claims 19 and 11 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 11. Claim 20 further requires:

"the data from the telemetry unit is transferred to at least one of: a walkman, a TV, a VCR, a DVD player, a CD player, a projection unit, a game console, a stereo and an internet site for entertainment purposes."

Claims 22 and 23 are each dependent upon Claim 21. Thus, Claims 22 and 23 include all of the language of Claim 21 and are submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 21. Claim 22 further requires:

> "the plantar pressure collection unit positions force sensor resistors and pressure sensors along a first phalange, a second phalange, a third phalange, a fourth phalange in the forefoot, along a first metatarsal head, a second metatarsal head, and a fourth metatarsal head in the forefoot, along a first metatarsal base, a fourth metatarsal base and a fifth metatarsal base in the midfoot, underneath a distal portion of a medial and a lateral side of a calcaneus in the midfoot, and at the medial and lateral surfaces of the calcaneus in the rearfoot, to provide accurate measurement of maximum pressure, mean pressure, and pressure line."

Claim 23 further requires:

> "independent measurements are taken for said user's right foot and left foot, and said processing and display units function independently for each foot."

Claim 26 is dependent upon Claim 24. Thus, Claim 26 includes all of the language of Claim 24 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 24. Claim 26 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and at least one rate sensor, said detachable processing unit further being in electrical communication with said lower shank motion collection unit and further being configured for processing data from said at least one accelerometer sensor and said at least one rate sensor."

Claim 28 is dependent upon Claim 27. Thus, Claim 28 includes all of the language of Claim 27 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 27. Claim 28 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and at least one rate sensor, said detachable processing unit being further in electrical communication with said lower shank motion collection unit and being further configured for processing data from said at least one accelerometer sensor and said at least one rate sensor of said lower shank motion collection unit."

Claim 32 is dependent upon Claim 30. Thus, Claim 32 includes all of the language of Claim 30 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 30. Claim 32 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, said detachable processing unit further being in electrical communication with the lower shank motion collection unit and further being configured for processing said lower shank motion data from said at least one accelerometer sensor and said plurality of rate sensors."

Claim 34 is dependent upon Claim 33. Thus, Claim 34 includes all of the language of Claim 33 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 33. Claim 34 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, which when combined with data from the rearfoot kinematic data, to provide three dimensional static and dynamic acceleration, angular velocity, 2-axis tilt information, and static and dynamic foot movements, said detachable processing unit further being in electrical communication with the lower shank motion collection unit and configured for processing said

lower shank motion data from said at least one accelerometer sensor and said plurality of rate sensors from said lower shank motion collection unit."

Claims 37 and 38 are each dependent upon Claim 36. Thus, Claims 37 and 38 include all of the language of Claim 36 and are submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 36. Claim 37 further requires:

> "a rearfoot motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to calculate rearfoot kinematic data crucial to identify the motions of pronation and supination, said detachable processing unit further being in electrical communication with the rearfoot motion collection unit and being further configured for processing said rearfoot kinematic data from said at least one accelerometer sensor and said plurality of rate sensors, said rearfoot kinematic data further being normalized by body weight calibration."

Claim 38 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, said detachable processing unit further being in electrical communication with the lower shank motion collection unit and further configured for processing said lower shank motion data from said at least one accelerometer sensor and said plurality of rate sensors, said lower shank motion data further being normalized by body weight calibration."

Claim 40 is dependent upon Claim 39. Thus, Claim 40 includes all of the language of Claim 39 and is submitted to be allowable for the same reasons as reiterated hereinabove with regard to Claim 39. Claim 40 further requires:

> "a lower shank motion collection unit having at least one accelerometer sensor and a plurality of rate sensors to provide lower shank motion data, which when combined with data from the rearfoot kinematic data, provides three dimensional static and

dynamic acceleration, angular velocity, 2-axis tilt information, and static and dynamic foot movements, said detachable processing unit further being in electrical communication with the lower shank motion collection unit and further configured for processing said lower shank motion data from said at least one accelerometer sensor and said plurality of rate sensors of said lower shank motion collection unit, which have been further normalized by body weight calibration."

Applicant submits that each of the claims presented, as amended, are in form for immediate allowance. Applicant respectfully solicits the prompt issuance of a Notice of Allowance.

Respectfully submitted,

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